| Applicants: | Gang Luo et al. | § | Art Unit: | 2162 |
| Serial No.: | 10/767,681 | § | | |
| | | § | Examiner: | Cam Y.T. Truong |
| Filed: | January 29, 2004 | § | | |
| For: | Rescheduling of Modification | § | Atty. Dkt. No.: | 11338 (NCR.0120US) |
| | Operations for Loading Data | § | | |
| | Into a Database System | § | | |

**Mail Stop Appeal Brief-Patents**
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

## APPEAL BRIEF PURSUANT TO 37 C.F.R § 41.37

Sir:

The final rejection of claims 1-4, 9-15, 18, and 20-26 is hereby appealed.

### I.   REAL PARTY IN INTEREST

The real party in interest is Teradata US Inc., formerly affiliated with NCR Corporation.

### II.   RELATED APPEALS AND INTERFERENCES

None.

### III.   STATUS OF THE CLAIMS

Claims 1-4, 9-15, 18, and 20-26 have been finally rejected and are the subject of this

appeal. Claims 5-8, 16, 17, and 19 have been cancelled.

Date of Deposit: _July 22, 2008_

I hereby certify under 37 CFR 1.8(a) that this correspondence is being transmitted electronically to the U.S. Patent Office on the date indicated above.
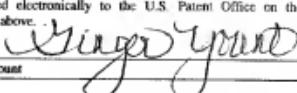
_Ginger Yount_

Ginger Yount

## IV.    STATUS OF AMENDMENTS

A request for reconsideration after final rejection was submitted on April 18, 2008. The claims were not amended in the request for reconsideration.

## V.    SUMMARY OF THE CLAIMED SUBJECT MATTER

The following provides a concise explanation of the subject matter defined in each of the independent claims involved in the appeal, referring to the specification by page and line number and to the drawings by reference characters, as required by 37 C.F.R. § 41.37(c)(1)(v). Each element of the claims is identified by a corresponding reference to the specification and drawings where applicable. Note that the citation to passages in the specification and drawings for each claim element does not imply that the limitations from the specification and drawings should be read into the corresponding claim element.

Independent claim 1 recites a method performed by software embodied in a computer-readable storage medium and executed by a computer in a database system that stores a join view associated with plural base relations, the method comprising:

receiving (Fig. 2:102) modification operations that modify at least two of the base relations of the join view, wherein the at least two base relations comprise a first base relation and a second base relation (Spec., p. 7, ¶ [0029]; p. 9, ¶ [0034]);

performing partitioning (Fig. 2:104) of the received modification operations by submitting at least some of the modification operations operating on the first base relation to a first session, and submitting at least another of the modification operations that operate on the second base relation to a second session (Spec., p. 8, ¶ [0033]);

grouping (Fig. 2:106) the at least some of the modification operations in the first session operating on the first base relation into a first transaction (Spec., p. 9, ¶ [0034]),

wherein the at least another modification operation in the second session is part of a second transaction (Spec., p. 9, ¶ [0035]); and

2

schedule (Fig. 2:108) the transactions to avoid execution of modification operations of more than one of the at least two base relations at one time in the database system (Spec., p. 9, ¶ [0035]).

Independent claim 12 recites an article comprising at least one computer-readable storage medium containing instructions that when executed cause a computer to:

receive (Fig. 2:102) modification operations that modify at least two of the base relations of a join view, wherein the at least two base relations comprise a first base relation and a second base relation (Spec., p. 7, ¶ [0029]; p. 9, ¶ [0034]);

perform partitioning (Fig. 2:104) of the received modification operations by submitting at least some of the modification operations operating on the first base relation to a first session, and submitting at least another of the modification operations that operate on a second base relation to a second session (Spec., p. 8, ¶ [0033]);

group (Fig. 2:106) the at least some of the modification operations in the first session operating on the first base relation into a first transaction (Spec., p. 9, ¶ [0034]),

wherein the at least another modification operation in the second session is part of a second transaction (Spec., p. 9, ¶ [0035]); and

schedule (Fig. 2:108) the transactions to avoid concurrent execution of transactions of more than one of the at least two base relations of the join view (Spec., p. 9, ¶ [0035]).

Independent claim 22 recites a first system (Fig. 1:28) comprising:

a controller having one or more processors to:

receive (Fig. 2:102) modification operations to modify plural base relations of a join view, the modification operations comprising modification operations to modify a first base relation of the join view, and modification operations to modify a second base relation of the join view (Spec., p. 7, ¶ [0029]; p. 9, ¶ [0034]); and

re-order (Fig. 2:106, 108) the received modification operations to avoid concurrent execution of modification operations of more than one of the plural base relations of the join view (Spec., p. 4, ¶ [0019]; p. 9, ¶¶ [0034]-[0035]),

the re-ordering to cause modification operations on the first base relation of the join view to be scheduled for execution, and to cause modification

operations on the second base relation to be queued for execution after completion of the modification operations on the first base relation (Spec., p. 4, ¶ [0019]; p. 9, ¶¶ [0034]-[0035]),

wherein certain of the modification operations on the first base relation comprise modification operations of a set of one or more tuples of the first base relation (Spec., p. 4, ¶ [0019]; p. 9, ¶¶ [0034]-[0035]), and wherein the controller is adapted to:

group (Fig. 2:106) the modification operations on the set of one or more tuples of the first base relation into a transaction (Spec., p. 9, ¶ [0034]); and

submit the transaction to a database system (Fig. 1:10) separate from the first system (Fig. 1:28) for execution (Spec., p. 5, ¶ [0022]).

## VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. **Claims 1-4, 12-15, 20, And 22 Rejected Under 35 U.S.C. § 103(a) As Unpatentable Over U.S. Patent No. 6,353,828 (Ganesh '828) In View Of U.S. Patent No. 6,714,943 (Ganesh '943).**

B. **Claims 9 And 10 Rejected Under 35 U.S.C. § 103(a) As Unpatentable Over Ganesh '828 In View Of Ganesh '943, And U.S. Patent No. 5,940,828 (Anaya).**

C. **Claim 11 Rejected Under 35 U.S.C. § 103(a) As Unpatentable Over Ganesh '828 In View Of Ganesh '943, Anaya, And U.S. Patent No. 5,442,785 (Roffe).**

D. **Claim 11 Rejected Under 35 U.S.C. § 103(a) As Unpatentable Over Ganesh '828 In View Of Ganesh '943, Anaya, And U.S. Patent Application Publication No. 2002/0133494 (Goedken).**

E. **Claim 18 Rejected Under 35 U.S.C. § 103(a) As Unpatentable Over Ganesh '828 In View Of Ganesh '943, And U.S. Patent No. 6,581,205 (Cochrane).**

F. **Claim 21 Rejected Under 35 U.S.C. § 103(a) As Unpatentable Over Ganesh '828 In View Of Ganesh '943, And U.S. Patent No. 6,574,717 (Ngai).**

G. **Claim 23 Rejected Under 35 U.S.C. § 103(a) As Unpatentable Over Ganesh '828 In View Of Ganesh '943, And U.S. Patent No. 6,678,701 (Garth).**

H. **Claims 24 And 25 Rejected Under 35 U.S.C. § 103(a) As Unpatentable Over Ganesh '828 In View Of Ganesh '943, Garth, And U.S. Patent No. 6,567,816 (Desai).**

I. **Claim 26 Rejected Under 35 U.S.C. § 103(a) As Unpatentable Over Ganesh '828 In View Of Ganesh '943, Garth, Desai, And U.S. Patent No. 6,151,601 (Papierniak).**

## VII.  ARGUMENT

The claims do not stand or fall together. Instead, Appellant presents separate arguments for various independent and dependent claims. Each of these arguments is separately argued below and presented with separate headings and sub-headings as required by 37 C.F.R. § 41.37(c)(1)(vii).

### A.  Claims 1-4, 12-15, 20, And 22 Rejected Under 35 U.S.C. § 103(a) As Unpatentable Over U.S. Patent No. 6,353,828 (Ganesh '828) In View Of U.S. Patent No. 6,714,943 (Ganesh '943).

#### 1.  Claims 1-4, 12-15.

Claim 1 was rejected as being purportedly obvious over Ganesh '828 and Ganesh '943. It is respectfully submitted that the obviousness rejection of claim 1 is defective.

To make a determination under 35 U.S.C. § 103, several basic factual inquiries must be performed, including determining the scope and content of the prior art, and ascertaining the differences between the prior art and the claims at issue. *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 U.S.P.Q. 459 (1965). Moreover, as the U.S. Supreme Court held, it is important to identify a reason that would have prompted a person of ordinary skill in the art to combine reference teachings in the manner that the claimed invention does. *KSR International Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1741, 82 U.S.P.Q.2d 1385 (2007).

Here, a comparison of the claimed subject matter and the teachings of the cited references will reveal that the claimed subject matter differs significantly from the teachings of the cited references.

The Examiner cited Ganesh '828 as disclosing the "receiving" element of claim 1, and the following phrase of claim 1: "schedule transactions to avoid execution of modification operations of more than one of the at least two base relations at one time in the database system."

5

2/8/2008 Office Action at 5. However, the Examiner conceded that Ganesh '828 fails to disclose the "performing partitioning" element and the "grouping" element of claim 1. *Id.* Instead, the Examiner relied upon Ganesh '943 as disclosing the claimed features missing from Ganesh '828. *Id.* at 5-6.

Ganesh '828 relates to maintaining a materialized view in response to changes to a base table by performing an incremental maintenance in which the entire materialized view is not regenerated every time a base table is changed. Ganesh '828, 3:15-18. Ganesh '828 also teaches that one transaction can place a lock on base tables of a materialized view such that a second transaction that requests an exclusive lock on the base tables would not be able to; rather, this second transaction would be suspended until the exclusive lock for the first transaction is released. Ganesh '828, 4:15-45.

The Examiner properly conceded that Ganesh '828 provides no teaching of (1) partitioning received modification operations (that modify at least first and second base relations) by submitting at least some of the modification operations operating on the first base relation to a first session, and submitting at least another of the modification operations that operate on the second base relation to a second session; and (2) grouping the at least some of the modification operations in the first session operating in the first base relation into a first transaction, wherein the at least another modification operation in the second session is part of a second transaction.

Contrary to the assertion made on page 6 of the Office Action, however, Ganesh '943 provides absolutely no hint of the partitioning recited in claim 1. Ganesh '943 teaches dependency tracking in a database system in which dependencies between transactions are tracked. Ganesh '943, 2:2-32. The Examiner cited specifically to the following passages of

Ganesh '943: column 4, lines 60-67, column 5, lines 1-20. The cited passage in columns 4 and 5 refers to a series of transactions. This passage of Ganesh '943 provides no teaching of the claimed subject matter.

The "partitioning" clause of claim 1 is as follows:

performing partitioning of the received modification operations by submitting at least some of the modification operations operating on the **first base relation** to a first session, and submitting at least another of the modification operations that operate on the **second base relation** to a second session;

The series of transactions depicted in columns 4 and 5 of Ganesh '943 all relate to the same relation: Emp_Table. There is absolutely no concept of partitioning received modification operations according to whether such operations operate on a first base relation or a second base relation. Moreover, there is absolutely no hint given in the cited passages of partitioning of the different modification operations operating on different base relations into first and second sessions.

Moreover, since Ganesh '943 does not disclose the concept of partitioning into first and second sessions, Ganesh '943 also does not disclose or hint at the following clause of claim 1: "grouping the at least some of the modification operations in the **first session** operating on the first base relation into a first transaction."

Thus, even if Ganesh '828 and Ganesh '943 could be hypothetically combined, the hypothetical combination of the references would not have led to the claimed subject matter.

Moreover, there simply did not exist any reason for a person of ordinary skill in the art to modify the teachings of Ganesh '828 and Ganesh '943 to achieve the claimed subject matter, which includes the "performing partitioning" and "grouping" clauses. *See KSR*, 127 S. Ct. at 1741. The concept of partitioning received modification operations operating on different base relations into different sessions, and grouping at least some of the modification operations in one

of the sessions, clearly does not exist anywhere in Ganesh '828 and Ganesh '943. Therefore, the only basis for the assertion of obviousness made by the Examiner is based on impermissible hindsight, since a person of ordinary skill in the art looking at the objective teachings of Ganesh '828 and Ganesh '943 would not have been led to the claimed invention.

In view of the foregoing, it is respectfully submitted that the obviousness rejection of claim 1 and its dependent claims is defective.

Independent claim 12 and its dependent claims are similarly non-obvious over Ganesh '828 and Ganesh '943.

Reversal of the final rejection of the above claims is respectfully requested.

## 2.   Claims 20, 22.

The obviousness rejection of independent claim 22 over Ganesh '828 and Ganesh '943 is also defective. The Examiner conceded that Ganesh '828 does not disclose the re-ordering clause of claim 22, and the grouping clause of claim 22. 2/8/2008 Office Action at 11. Instead, the Examiner relied upon Ganesh '943. *Id.* at 11-12.

The Examiner referred to Ganesh '943's teachings that certain transactions having a dependent SCN of "0" can be ordered before, after, or parallel to any other transaction, and that other transactions having a dependent SCN value of 5 must be scheduled to begin after all other transactions SCN values of 5 or less have completed and committed. The Examiner further referred to column 5, lines 1-20, of Ganesh '943, which illustrates SQL statements in transactions.

However, there is no teaching or hint provided in Ganesh '943 of the following subject matter of claim 22. Claim 22 recites that certain of the modification operations on the first base relation include modification operations of a set of one or more tuples of the first base relation,

8

and that the controller is to group the modification operations on the set of one or more tuples of the first base relation into a transaction, and that the transaction is submitted to a database system separate from the first system for execution.

The statements depicted in column 5, lines 1-20, of Ganesh '943 are predefined statements of particular transactions. However, there is no teaching that the modification operations that operate on a set of one or more tuples of a first base relation are grouped by a controller, as recited in claim 22, in combination with submitting such transaction to a database system separate from the first system for execution.

Therefore, even if Ganesh '828 and Ganesh '943 can be hypothetically combined, the hypothetical combination of the references does not disclose or hint at all elements of claim 22. Moreover, as explained above, no reason existed to combine Ganesh '828 and Ganesh '943. Therefore, claim 22 is clearly non-obvious over Ganesh '828 and Ganesh '943.

Reversal of the final rejection of the above claims is respectfully requested.

## B.    Claims 9 And 10 Rejected Under 35 U.S.C. § 103(a) As Unpatentable Over Ganesh '828 In View Of Ganesh '943, And U.S. Patent No. 5,940,828 (Anaya).

### 1.    Claims 9, 10.

In view of the defective obviousness rejection of base claim 1 over Ganesh '828 and Ganesh '943, it is respectfully submitted that the obviousness rejection of dependent claims over Ganesh '828, Ganesh '943, and Anaya is also defective.

Reversal of the final rejection of the above claims is respectfully requested.

**C.    Claim 11 Rejected Under 35 U.S.C. § 103(a) As Unpatentable Over Ganesh '828 In View Of Ganesh '943, Anaya, And U.S. Patent No. 5,442,785 (Roffe).**

### 1.    Claim 11.

In view of the defective obviousness rejections of base claims, it is respectfully submitted that the obviousness rejection of claim 11 over Ganesh '828, Ganesh '943, Anaya, and Roffe is also defective.

Reversal of the final rejection of the above claims is respectfully requested.

**D.    Claim 11 Rejected Under 35 U.S.C. § 103(a) As Unpatentable Over Ganesh '828 In View Of Ganesh '943, Anaya, And U.S. Patent Application Publication No. 2002/0133494 (Goedken).**

### 1.    Claim 11.

In view of the defective obviousness rejections of base claims, the obviousness rejection of claim 11 over Ganesh '828, Ganesh '943, Anaya, and Goedken is also defective.

Reversal of the final rejection of the above claim is respectfully requested.

**E.    Claim 18 Rejected Under 35 U.S.C. § 103(a) As Unpatentable Over Ganesh '828 In View Of Ganesh '943, And U.S. Patent No. 6,581,205 (Cochrane).**

### 1.    Claim 18.

In view of the defective obviousness rejection of base claim 12 over Ganesh '828 and Ganesh '943, it is respectfully submitted that the obviousness rejection of dependent claim 18 over Ganesh '828, Ganesh '943, and Cochrane is also defective.

Reversal of the final rejection of the above claim is respectfully requested.

**F.   Claim 21 Rejected Under 35 U.S.C. § 103(a) As Unpatentable Over Ganesh '828 In View Of Ganesh '943, And U.S. Patent No. 6,574,717 (Ngai).**

    **1.   Claim 21.**

In view of the defective obviousness rejection of base claim 22 over Ganesh '828 and

Ganesh '943, it is respectfully submitted that the obviousness rejection of dependent claim 21

over Ganesh '828, Ganesh '943, and Ngai is also defective.

Reversal of the final rejection of the above claim is therefore respectfully requested.

**G.   Claim 23 Rejected Under 35 U.S.C. § 103(a) As Unpatentable Over Ganesh '828 In View Of Ganesh '943, And U.S. Patent No. 6,678,701 (Garth).**

    **1.   Claim 23.**

In view of the defective obviousness rejection of base claim 22 over Ganesh '828 and

Ganesh '943, it is respectfully submitted that the obviousness rejection of claim 23 over Ganesh

'828, Ganesh '943, and Garth is defective.

Reversal of the final rejection of the above claim is therefore respectfully requested.

**H.   Claims 24 And 25 Rejected Under 35 U.S.C. § 103(a) As Unpatentable Over Ganesh '828 In View Of Ganesh '943, Garth, And U.S. Patent No. 6,567,816 (Desai).**

    **1.   Claims 24, 25.**

In view of the defective obviousness rejections of base claims, it is respectfully submitted

that the obviousness rejection of dependent claims 24 and 25 over Ganesh '828, Ganesh '943,

Garth, and Desai is also defective.

Reversal of the final rejection of the above claims is therefore respectfully requested.

I.   **Claim 26 Rejected Under 35 U.S.C. § 103(a) As Unpatentable Over Ganesh '828 In View Of Ganesh '943, Garth, Desai, And U.S. Patent No. 6,151,601 (Papierniak).**

   **1.   Claim 26.**

   In view of the defective obviousness rejection of base claims, it is respectfully submitted that the obviousness rejection of claim 26 over Ganesh '828, Ganesh '943, and Garth, Desai, and Papierniak is also defective.

   Reversal of the final rejection of the above claim is respectfully requested.

## CONCLUSION

   In view of the foregoing, reversal of all final rejections and allowance of all pending claims is respectfully requested.

Respectfully submitted,

Date: _Jul 28, 2008_

Dan C. Hu
Registration No. 40,025
TROP, PRUNER & HU, P.C.
1616 South Voss Road, Suite 750
Houston, TX  77057-2631
Telephone:  (713) 468-8880
Facsimile:  (713) 468-8883

12

## VIII.  APPENDIX OF APPEALED CLAIMS

The claims on appeal are:

1. 1. A method performed by software embodied in a computer-readable storage
2. medium and executed by a computer in a database system that stores a join view associated with
3. plural base relations, the method comprising:
4.     receiving modification operations that modify at least two of the base relations of
5. the join view, wherein the at least two base relations comprise a first base relation and a second
6. base relation;
7.     performing partitioning of the received modification operations by submitting at
8. least some of the modification operations operating on the first base relation to a first session,
9. and submitting at least another of the modification operations that operate on the second base
10. relation to a second session;
11.     grouping the at least some of the modification operations in the first session
12. operating on the first base relation into a first transaction,
13.     wherein the at least another modification operation in the second session is part of
14. a second transaction; and
15.     schedule the transactions to avoid execution of modification operations of more
16. than one of the at least two base relations at one time in the database system.

1. 2. The method of claim 1, wherein scheduling the transactions comprises:
2.     determining that the first transaction conflicts with the second transaction based
3. on the first and second transactions modifying more than one base relation of the join view; and
4.     selecting one of the first and second transactions for execution in the database
5. system.

1. 3. The method of claim 2, wherein selecting one of the first and second transactions
2. comprises selecting the first transaction,
3.     the method further comprising storing the second transaction in a queue.

1     4.     The method of claim 3, further comprising waiting for the first transaction to
2   complete execution before scheduling the second transaction for execution.


1     9.     The method of claim 1, further comprising:
2            storing pending transactions in plural queues corresponding to respective plural
3   sessions of the database system; and
4            selecting one of the pending transactions from the queues to schedule for
5   execution in the database system based on whether the one pending transaction conflicts with
6   one or more executing transactions in the database system.


1     10.    The method of claim 9, further comprising determining that the one pending
2   transaction conflicts with the one or more executing transactions in response to determining that
3   the one pending transaction modifies a different one of the base relations of the join view than a
4   base relation of the join view modified by an executing transaction.


1     11.    The method of claim 9, further comprising applying a technique to prevent
2   starvation of a particular one of the pending transactions in response to determining that the
3   particular one pending transaction has been in one of the queues for longer than a predetermined
4   time period.

1      12.    An article comprising at least one computer-readable storage medium containing

2    instructions that when executed cause a computer to:

3          receive modification operations that modify at least two of the base relations of a

4    join view, wherein the at least two base relations comprise a first base relation and a second base

5    relation;

6          perform partitioning of the received modification operations by submitting at least

7    some of the modification operations operating on the first base relation to a first session, and

8    submitting at least another of the modification operations that operate on a second base relation

9    to a second session;

10          group the at least some of the modification operations in the first session

11    operating on the first base relation into a first transaction,

12          wherein the at least another modification operation in the second session is part of

13    a second transaction; and

14          schedule the transactions to avoid concurrent execution of transactions of more

15    than one of the at least two base relations of the join view.

1      13.    The article of claim 12, wherein scheduling the transactions comprises:

2          determining that the first transaction conflicts with the second transaction based

3    on the first and second transactions modifying more than one base relation of the join view; and

4          selecting one of the first and second transactions for execution in the database

5    system.

1      14.    The article of claim 13, wherein selecting one of the first and second transactions

2    comprises selecting the first transaction,

3          the instructions when executed causing the system to further store the second

4    transaction in a queue.

1      15.    The article of claim 14, wherein the instructions when executed cause the

2    computer to wait for the first transaction to complete execution before scheduling the second

3    transaction for execution.

1    18.    The article of claim 12, wherein the instructions when executed cause the
2    computer to:

3          in response to a particular one of the modification operations to modify one of the
4    base relations, place an exclusive lock on the one base relation, and place a predefined lock on
5    the join view,

6          the predefined lock conflicting with each of a shared lock and an exclusive lock
7    placed on the join view, but the predefined lock not conflicting with another predefined lock
8    placed on the join view.

1    20.    The first system of claim 22, wherein the controller is adapted to identify the
2    modification operations on the second base relation as conflicting with the modification
3    operations on the first base relation in response to determining that the modification operations
4    on the second base relation are modifying a different base relation of the join view than the
5    modification operations on the first base relation.

1    21.    The first system of claim 22, wherein the controller is adapted to open plural
2    sessions with the database system that is separate from the first system,

3          the controller to further:

4          identify modification operations on the first base relation that modify
5    distinct portions of the first base relation; and

6          submit the identified modification operations that modify distinct portions
7    of the first base relation through different sessions for concurrent execution in the database
8    system.

22.     A first system comprising:

a controller having one or more processors to:

receive modification operations to modify plural base relations of a join view, the modification operations comprising modification operations to modify a first base relation of the join view, and modification operations to modify a second base relation of the join view; and

re-order the received modification operations to avoid concurrent execution of modification operations of more than one of the plural base relations of the join view,

the re-ordering to cause modification operations on the first base relation of the join view to be scheduled for execution, and to cause modification operations on the second base relation to be queued for execution after completion of the modification operations on the first base relation,

wherein certain of the modification operations on the first base relation comprise modification operations of a set of one or more tuples of the first base relation, and wherein the controller is adapted to:

group the modification operations on the set of one or more tuples of the first base relation into a transaction; and

submit the transaction to a database system separate from the first system for execution.

23.     The first system of claim 22, wherein the controller comprises a load utility to submit the modification operations to the database system.

24.     (Previously Presented) The first system of claim 23, wherein the load utility comprises a continuous load utility.

25.     The first system of claim 23, wherein the load utility comprises a first load utility, and the controller comprises a second load utility to concurrently submit other modification operations to the database system.

1       26.    The first system of claim 25, further comprising plural platforms on which

2   corresponding first and second load utilities are executable.

## IX.  **EVIDENCE APPENDIX**

None.

# X.    RELATED PROCEEDINGS APPENDIX

None.